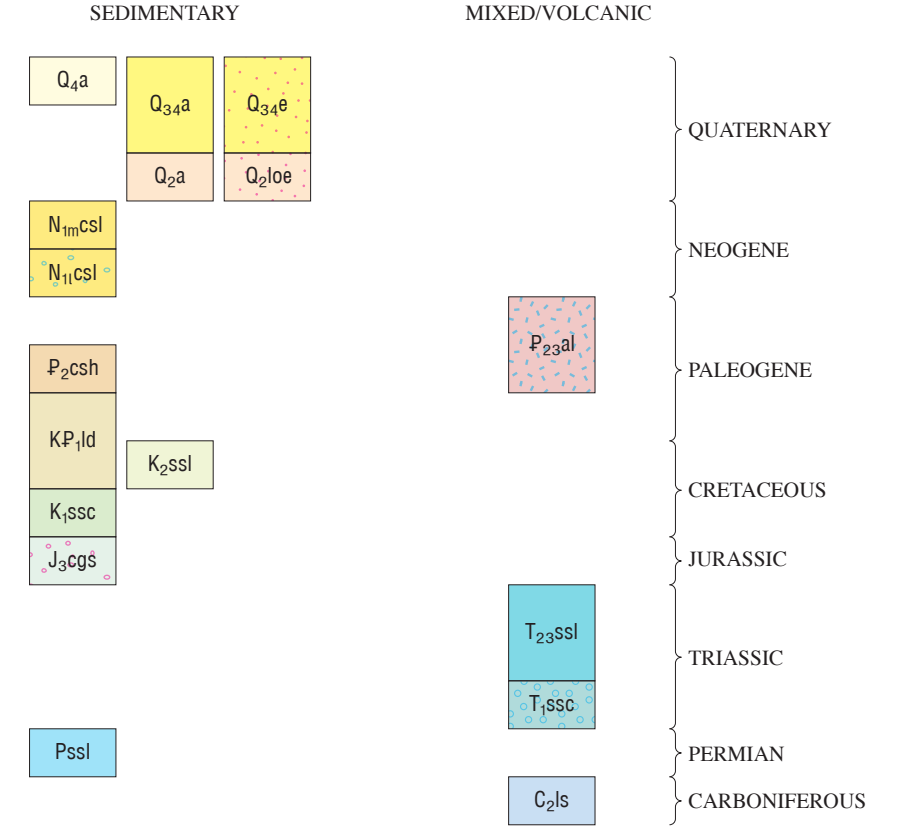


#### CORRELATION OF MAP UNITS



#### DESCRIPTION OF MAP UNITS

- Qa** Conglomerate and sandstone (Holocene) - Alluvium: shingly sand and detrital sediments, gravel, sand more abundant than silt and clay
- Qal** Conglomerate and sandstone (Holocene and late Pleistocene) - Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay
- Qat** Eolian deposits (Holocene and late Pleistocene) - Sand
- Qad** Loess (middle Pleistocene) - Loess more abundant than sand and clay
- Qae** Conglomerate and sandstone (middle Pleistocene) - Alluvium: shingly and detrital sediments, gravel, sand more abundant than silt and clay
- Qaf** Clay and siltstone (middle Miocene) - Brown clay, siltstone more abundant than sandstone, conglomerate, limestone
- Qag** Clay and siltstone (early Miocene) - Red clay, siltstone more abundant than sandstone, conglomerate, limestone
- Qah** Andesite lava (Oligocene and Eocene) - Basaltic andesite, basalt, trachyte, dacite, rhyolite, ignimbrite and tuff, conglomerate, sandstone, siltstone and limestone
- Qai** Clay and shale (Eocene) - Clay, shale, siltstone more abundant than sandstone, limestone, marl, gypsum, conglomerate
- Qaj** Limestone and dolomite (Paleocene and Late Cretaceous) - Limestone, marl, dolomite more abundant than sandstone, clay, siltstone, gypsum, conglomerate
- Qak** Sandstone and siltstone (Late Cretaceous) - Sandstone, siltstone more abundant than clay, limestone, marl, conglomerate, gypsum
- Qal** Sandstone and conglomerate (Early Cretaceous) - Red sandstone, conglomerate more abundant than siltstone, gypsum, clay
- Qam** Conglomerate and sandstone (Late Jurassic) - Conglomerate, sandstone more abundant than siltstone, clay, limestone, gypsum
- Qan** Sandstone and siltstone (Late and Middle Triassic) - Sandstone and siltstone more abundant than mudstone, carbonaceous shale, limestone, marl, conglomerate, acid and mafic volcanic rocks
- Qao** Sandstone and conglomerate (Early Triassic) - Variegated sandstone, gravelstone, conglomerate, chert, rhyolite and basalt volcanic rocks
- Qap** Sandstone and siltstone (Permian) - Red and variegated sandstone and siltstone more abundant than mudstone, conglomerate and gravelstone
- Qaq** Limestone (Late Carboniferous) - Limestone more abundant than slate, sandstone, conglomerate, siltstone, andesite to basalt volcanic rocks

#### EXPLANATION OF MAP SYMBOLS

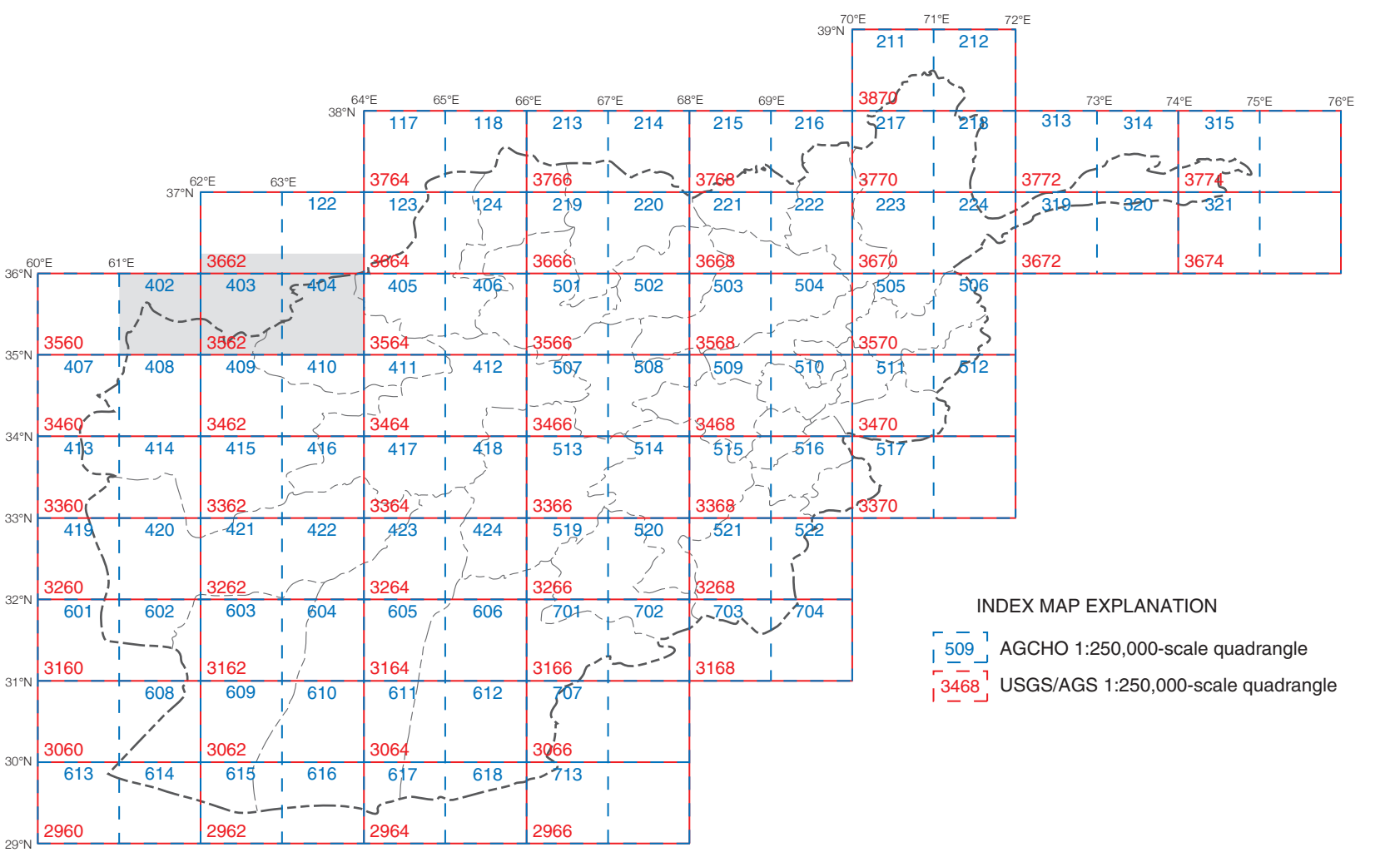
- Contact** - Solid line
- Fault** - Dashed where approximately located; dotted where concealed

#### DATA SUMMARY

This map was produced from several larger digital datasets. Topography was derived from Shuttle Radar Topography Mission (SRTM) 30-meter digital data. Gaps in the original dataset were filled with data digitized from contours on 1:200,000 scale Soviet General Staff Sheets (1978-1997). Contours were generated by cubic convolution averaged over four pixels using 'NTM' surface-modeling capabilities. Cultural data were extracted from files downloaded from the Afghanistan Information Management Service (AIMS) Web site (<http://www.aims.org.af>). The AIMS files were originally derived from maps produced by the Afghanistan Geodesy and Cartography Head Office (AGCHO). Geologic data and the international boundary of Afghanistan were taken directly from Abdullah and Chmyrov (1977). It is the primary intent of the U.S. Geological Survey (USGS) to present the geologic data in a useful format while making them publicly available. These data represent the state of geologic mapping in Afghanistan as of 2005, although the original map was released in the late 1970s (Abdullah and Chmyrov, 1977). The USGS has made no attempt to modify original geologic map-unit boundaries and faults; however, modifications to map-unit symbols, and minor modifications to map-unit descriptions, have been made to clarify lithostratigraphy and to modernize terminology. The generation of a Correlation of Map Units (CMU) diagram required interpretation of the original data, because no CMU diagram was presented by Abdullah and Chmyrov (1977). This map is part of a series that includes a geologic map, a topographic map, a Landsat natural-color image map, and a Landsat false-color image map for the USGS/AGS (Afghan Geological Survey) quadrangles shown on the index map. The maps for any given quadrangle have the same open file number but a different letter suffix, namely, -A, -B, -C, and -D for the geologic, topographic, Landsat natural-color, and Landsat false-color maps, respectively. The present map series is to be followed by a second series, in which the geology is reinterpreted on the basis of analysis of remote sensing data, limited fieldwork, and library research. The second series is to be produced by the USGS in cooperation with the AGS and AGCHO.

#### REFERENCE CITED

Abdullah, Sh., and Chmyrov, V.M., eds., 1977. Map of mineral resources of Afghanistan. Kabul, Ministry of Mines and Industries of the Democratic Republic of Afghanistan, Department of Geological and Mineral Survey, V/O "Technosport" USSR, scale 1:500,000.  
Computer analysis software developed by Microtag, Inc., Lincoln, NE 68508, 2010.



#### INDEX MAP EXPLANATION

- 509 AGO 1:250,000-scale quadrangle
- 3562 USGS/AGS 1:250,000-scale quadrangle

### GEOLOGIC MAP OF QUADRANGLES 3560, 3562, AND 3662, SIR BAND (402), KHAWJA-JIR (403), BALA-MURGHAB (404), AND DARA-I-SHOR-I-KARAMANDI (122) QUADRANGLES, AFGHANISTAN

Compiled by  
Kevin C. McKinney and David J. Lidke  
2005

